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CONTROLLING ROOSTING STARLINGS IN INDUSTRIAL FACILITIES BY BAITING

Bernice U. Constantin[1/] and James F. Glahn[2/]

ABSTRACT

During the winters of 1987-88 and 1988-89 a study was conducted to evaluate the potential of DRC-1339 baiting for controlling roosting European Starlings (Sturnus vulgarus) at Tennessee Eastman Company's chemical manufacturing plant in Kingsport, Tennessee. In 1987-88 Starlicide CompleteR (1% DRC-1339 treated poultry pellets diluted 1:9 with untreated poultry pellets) was used in preroosting congregating areas adjacent to the roost. In 1988-89 Starlicide CompleteR and DRC-1339 treated bread were used in bait containers placed in the roosting structure. Although 90 lbs of Starlicide CompleteR was consumed during 1987-88, bait consumption was sporadic and no appreciable change in the starling population was observed. In 1988-89 baiting in the roosting structure, particularly with bread bait, appeared to provide a more consistent pattern of bait consumption and resulted in a pronounced reduction of the roosting starling population. Overall, DRC-1339 baiting appears to have potential for safely and effectively controlling roosting starlings in industrial sites where few alternatives presently exist.

1/ USDA-Animal Damage Control
Louisville, KY 40299
2/ USDA-Science & Technology
Mississippi State, MS 39762

INTRODUCTION

The European starling was introduced into North America near New York City in 1890 (Lowery 1974). Once established, the starling's range expanded rapidly, and it now breeds ubiquitously over most of the United States and southern Canada (Farrand 1988). Starlings also winter in large congregations throughout much of the United States usually in mixed woodland habitat, many times associated with blackbirds (Heisterberg 1978).

This highly adaptable and gregarious bird has found that the warmth and security of industrial processing plants also provide ideal winter roosting habitat, especially during extremely cold weather. The intricate piping system provides many roosting spots and the heat from steam pipes and chemical processing provides warmth which makes industrial plants ideal for winter roosting birds. The principal complaint against these industrial roosts is the filth and unsafe working conditions created by the large accumulation of droppings on and under elevated walkways and pipes. The droppings create a slippery surface on pipes where workers must walk. Also, acid from the droppings corrodes pipes, instruments, vehicles, and other surfaces. The smell caused by these roosts is also unpleasant for plant employees and visitors.

In such roosts, traditional harassment techniques, such as the use of pyrotechnics and electronic units are prohibited because of the production of flammable and sensitive chemicals. In addition, the expansive roosting area created by miles of piping systems generally preclude exclusion through netting or the use of chemical repellents and toxicants applied to the roosting structure. In these situations it appeared that toxic baiting could provide an acceptable method of roost population reduction where few alternative means exist.

DRC-1339 (3-chloro-4-methylbenzenamine HCL) is a slow-acting avicide that was registered as a bait in 1967 for controlling starlings and at present is the single most effective means of controlling starlings at livestock feed-lots (Glahn 1982). Baiting roosting starlings in staging areas has been shown to be an effective way of reducing numbers of birds using a roost (West 1968, Knittle et al. 1980, Glahn and Heisterberg 1981); however, baiting starlings at industrial roosts has never been reported and required modifications of existing procedures for baiting roosting starlings.

A 2 year study to evaluate the potential of DRC-1339 baiting for starling control was conducted at a 1,600 acre chemical plant in Kingsport, Tennessee operated by the Tennessee Eastman Company. According to plant officials, starlings had roosted at the plant for at least 15 years and all previous attempts to rid the plant of starlings had failed. Although starlings were normally present throughout the winter months (November - March), starling populations fluctuated greatly with the highest populations occurring during severe weather conditions.

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METHODS

During the winter of 1987-1988 all baiting was done along a small (<10 acres) grassy road embankment on the southwest side of the plant over which most of the roosting starlings passed on their way to roost. Beginning on December 10, 1987, this site was prebaited with untreated poultry pellets and corn chops placed in 6 (2 ft x 8 ft) wooden bait containers (2 per station at 3 stations). Prebaiting continued for several weeks to attract birds to feed before going to roost. Starlicide CompleteR, a 1% DRC-1339 treated poultry pellet bait diluted 1:9 with untreated pellets, manufactured by Purina Mills Co., St. Louis, MO (use of trade name does not imply Government endorsement), was used for baiting in the same bait containers from January 26 to February 17.

Information collected during baiting included weather

conditions, bird use of bait sites, amount of bait applied and consumed, size of roosting populations, and numbers of dead birds picked up on the plant grounds. Baiting commenced on January 26, 1988. Bait was applied at the rate of 20 lbs per station. Baiting stations were checked daily, Monday thru Friday, for bait consumption. When bait was consumed, additional bait was added so that each station had 20 lbs of bait daily. Observations were made daily at each station and all bird activity at the bait site was recorded. Target birds using the site were counted and all nontarget birds observed feeding at the bait site were recorded by species and numbers. Daily counts were made of birds entering the roost in the evenings or leaving in the morning. Any bird activity at bait stations was recorded during the bird counts. Baiting continued until February 17, 1988. Vehicle searches of the plant grounds were made daily during the baiting period and all dead birds found were picked up, recorded, and disposed of by incineration.

During the winter of 1988-1989 pre-baiting began on November 9, 1988 at the previous years baiting site using similar methods. After 2 weeks of unsuccessfully trying to attract the birds to the original bait site and other similar sites, prebaiting was attempted in the roosting structure to see if the birds would feed there. Bait containers consisted of sixteen wooden trays approximately 2 feet by 4 feet and four round plastic trash can lids attached to the top of pipes and support structures in the plant where birds were roosting. After 2 weeks prebaiting in the roost, good bait acceptance was established and only trash can lids were used because of ease of installation and acceptance. Starlicide CompleteR was then applied at the rate of 5 lbs per baiting station in 38 stations. Baiting with Starlicide CompleteR pellets took place from December 8, 1988 through January 9, 1989 primarily, with some use on February 10 & 11. On January 4, 1989, 13 selected stations were prebaited with cut bread dipped in corn oil. The bread was readily accepted and after 2 weeks of prebaiting with bread, all of the stations were baited with DRC-1339 treated bread. The DRC-1339 bread bait was applied at the rate of 3-4 pounds per station from January 18 through February 9.

The formulation used to treat the bread was as follows: 10 lbs of bread was cut evenly into 50 equal pieces per slice. Sixteen lbs of margarine was warmed under heat until it was liquid. Margarine was eventually replaced by an equivalent amount of corn oil at room temperature. Thirty grams of DRC-1339 was thoroughly mixed into the liquid oil. The bread pieces were dipped into the DRC-1339/oil solution mixture and then drained and cooled on a screen. The 10 lbs (approximately 9000 pieces) of treated bread was mixed with 40 lbs of untreated cut up bread before use.

RESULTS AND DISCUSSION

During the winter of 1987-1988 90 lbs of treated starlicide bait was consumed from a total of 275 lbs applied. Based on the approximation that 200 starlings are killed for every pound of Starlicide CompleteR consumed (Schafer et al. 1978) an estimated 18,000 starlings were killed during that treatment period. Bait consumption (70 lbs) was sporadic and occurred primarily during the first 2 days of baiting when weather conditions were cold (<32 F), but increased again when weather turned cold on February 12, 1988. Up to 3,500 starlings fed at the site at one time. However, only a small percent-age of birds on flight lines appeared to use this site. The only other species feeding at this site were an unknown number of pigeons and 3 crows and at least 35 pigeons were included in the 900 dead birds picked up at the plant. Although 900 appears to be a small number considering the projected 18,000 birds killed, past studies have shown that because of the slow acting properties of DRC-1339, only a small percentage of birds die at the roost (Glahn and Heisterberg 1981).

Although the roosting population appeared to decline from 25,000 to 15,000 after the first 2 days of baiting, it returned to almost pretreatment levels after the first week in February. This may have been the result of new birds moving into this roost from other surrounding roosts.

During the winter of 1988-89, 169 lbs of Starlicide CompleteR pellets were consumed from the 589 lbs applied between December 8 and January 9. Bait acceptance gradually decreased during this period and much of the bait was wasted because of wet weather. Of the 331 lbs of DRC-1339 treated bread bait applied, 195 lbs were consumed. Bread bait appeared to have been better accepted than the pellets and was accepted under varying weather conditions. Observations indicated that bread bait offered to starlings directly in occupied roosting areas was completely consumed, while bait stations just outside the roosting area had no detectable consumption. Observations also indicated that starlings would land in the specific area of the plant for roosting and then feed on the bait until dark.

In 1988-89, 3,795 dead birds were picked up during the 5 weeks of baiting with Starlicide CompleteR pellets and 9,455 dead birds were picked up during the 4 weeks of baiting with DRC-1339 treated bread bait. Based on these data, there appeared to be a significant increase in baiting effectiveness compared with the previous year, which we attribute to baiting directly in the roost and use of the preferred bread bait.

It is difficult to extrapolate the kill for this year from bait consumption, but assuming that, birds found dead (13,250 starlings and 2 pigeons) represent 10-20% of total kill (Glahn and Heisterberg 1981) then between 66,000 and 132,000 birds were killed.

The average roost size in 1988-89 before baiting was 46,000 starlings, but peaked at 68,000 the first week of January in response to cold weather. During the baiting period with bread bait, the number of roosting birds appeared to decline from previous peak populations to between 10,000 and 17,000 starlings in mid February. The estimated large number of birds killed this year may be accounted for by possible larger starling populations occurring in the area than the numbers roosting at the plant on a given night.

CONCLUSIONS AND RECOMMENDATIONS

Although additional studies are needed to clarify the role of baiting as a control technique for roosting starlings in industrial sites, this study demonstrates the potential of this method. In contrast to other studies, (West 1968, Knittle et al. 1980, Glahn and Heisterberg 1981) where DRC-1339 baiting has been evaluated for roost control, the most promising area of bait placement appeared to be in the roosting structure rather than in adjacent areas surrounding the roost. Although starlings normally congregate in adjacent areas prior to roosting, roosting starlings in industrial sites prefer to congregate in the roosting structure and will readily feed on bait in these areas. Bait site areas can be readily identified by dropping accumulations, and bait placed in elevated locations tend to minimize the potential for nontarget hazards since no desirable species appeared to be using these locations. The use of bread as a bait when compared with poultry pellets suggests bread is highly preferred by starlings and results in increased effectiveness for reducing starling populations. Since bread is a time consuming bait to prepare, a possible alternative is the use of prepared french fried potatoes, currently used for control of starlings in western feedlots (personal communication, Mike Fitzler, District Supervisor, USDA-Animal Damage Control, Union Gap, WA 98903)

Although DRC-1339 baiting shows promise for safely and effectively reducing starlings in industrial sites, it is labor intensive and may require an extended period to achieve desired results because of the influx of birds from surrounding areas during periods of cold weather. This latter problem can be partly overcome by baiting all roosting sites with sufficient quantities of bait during these periods when starling populations and bait acceptance are at their highest.

REFERENCES CITED

Farrand, J., Jr. 1988. Eastern birds. McGraw-Hill Book Company, New York. 496 Pp.

Glahn, J.F. 1982. Use of starlicide to reduce starling damage at livestock feeding operations. Proc. Great Plains Wildl. Damage Wkshp. 5:273-277.

Glahn, J.F. and J.F. Heisterberg. 1981. Baiting trials with DRC-1339 treated baits at pre-roosting staging areas near Bowling Green Kentucky for reducing winter roosting starlings and blackbirds. Denver Wildlife Research Center, Bird Damage Research Report No. 198. Pp 1-29.

Heisterberg, J.F. 1978. Blackbird-starling roost survey in Kentucky and Tennessee, December 1977-1978. Denver Wildlife Research Center, Bird Damage Research Report No. 87.

Knittle, C.E., J.L. Guarino, P.C. Nelson, R.W. Dehaven and D.J. Twedt. 1980. Baiting blackbird and starling congregating areas in Kentucky and Tennessee. Proc. Vertebr. Pest Conf. 9:31-37.

Lowery, G.H., Jr. 1974. Louisiana birds. Louisiana State University Press, Baton Rouge, Louisiana. 651 Pp.

Schafer, E.W., Jr. R.B. Brunton, E.C. Schafer and G. Chavez. 1978. Food consumption and mortality of starlings fed starlicide complete pellets. Denver Wildlife Research Center, Bird Damage Research Report No. 93. Pp 1-3.

West, R.R. 1968. Reduction of a winter starling population by baiting in preroosting areas. Journal Wildl. Manage. 32:637-640.